

PROGRAMMA  
INTERNATIONAL, Inc.  
2908 N. Naomi Street  
Burbank, CA 91504  
(213) 954-0240

Dear Customer:

PROGRAMMA's 80-GRAFIX board may be purchased by the following terms:

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Money Order  
Personal Check  
C.O.D.

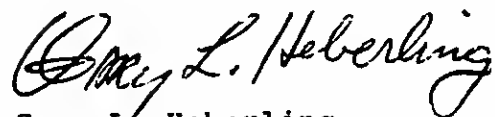
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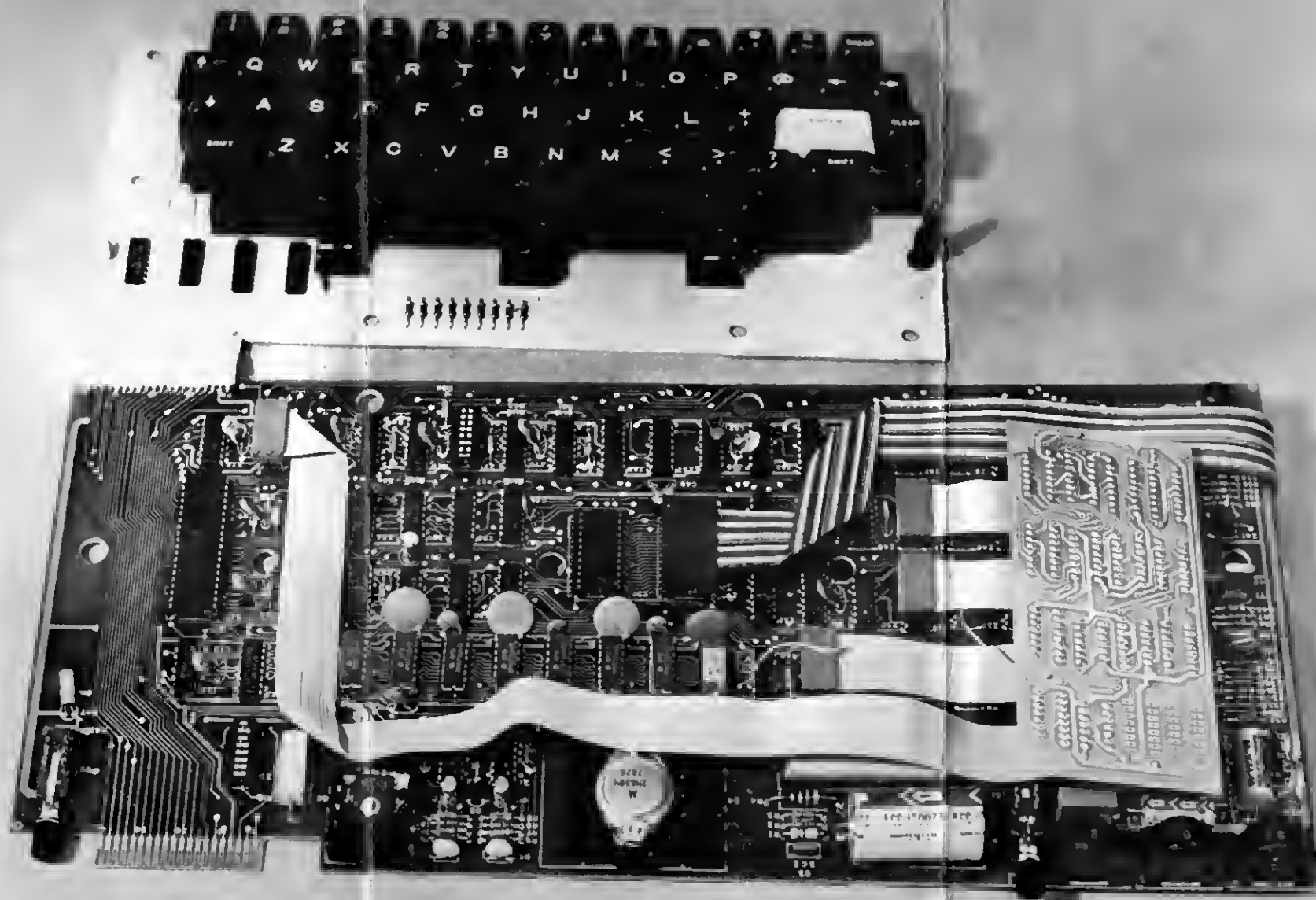
C.O.D. orders will only be accepted if shipment can be made via ~~United Parcel Service~~ on a cash or cashier's check basis. UPS will not deliver to a ~~post office box~~ and only delivers to points within the continental United States and other selected areas.

80-GRAFIX costs 149.95 plus \$4.50 shipping and handling (California residents add \$9.00 sales tax). When ordering, please be sure to type or print all shipping and billing information clearly. Thank you for your interest in PROGRAMMA!

Sincerely yours,



Gary L. Heberling  
Product Support



**Figure 1**

# 80-GRAFIX

## HOW GRAPHIC IS YOUR TRS-80?

Get Graphic, really graphic, with the hottest new offering for your Model I, TRS-80... PROGRAMMA's exclusive Hi-Resolution 80-GRAFIX Board.

With its greater high-resolution capability, our 80-GRAFIX board updates your TRS-80, and outdoes the Commodore CBM/PET, and even the polished APPLE II. In short, anything they can do, you can now do better!

As for effective screen pixels, imagine this. The 80-GRAFIX gives your TRS-80 an effective screen of 384x192 pixels (versus the normal 128x48)... while the CBM/PET is 80x50, and the APPLE II 280x192.

For sheer fun, enjoyment and effectiveness, the 80-GRAFIX board really has it. And you can have it, complete as described for only \$149.95 plus shipping. (California residents add 6% sales tax)

## BLACK & WHITE or VICE-VERSA

Use white on black, or call up an Inverse Video character set as the need demands. You can do either for greater flexibility and variety and clarity.

## FREE LOWER CASE

No need to spend extra. The 80-GRAFIX board includes not one but two sets of lower case characters as part of the software package. Plus, you can create your own set of up to 64 original characters using the supplied Character Generator software!

## GREAT GRAPHICS

The 80-GRAFIX board lets you show your skill and artistic flair. Pick a subject. Draw it, sketch it, change it... invent your own. Limited only by your own imagination... unlimited in fun for everyone. Because 80-GRAFIX lets you develop your own software... do it easily, quickly... create fantastic new real-time games to amuse or challenge.

## THEORY OF OPERATION

The video section of your TRS-80 consists of a 1K block of RAM, a Character ROM which generates the alpha-numeric characters, and a multiplexer which allows the generation of crude graphics with a resolution of 128 horizontal by 48 vertical pixels. Each alpha-numeric character is stored in the Character ROM as a pattern of bits in a matrix of 5 horizontal and 7 vertical. Graphic characters are stored somewhat differently.

The 80-GRAFIX board supplies an alternate graphics memory which gives the graphics mode a selection of dot patterns. These patterns are stored each as a grid of 6 horizontal by 12 vertical. The installation of the 80-GRAFIX board expands the graphics screen to a resolution of 384 horizontal and 192 vertical pixels. The 80-GRAFIX board has onboard a 1K x 6 (bit) block of memory which serves as the Programmable Character RAM from which the Video RAM will summon the user definable characters. 80-GRAFIX allows access to every dot in every line of each character.

The 80-GRAFIX board provides a software controlled graphics system, which operates in three modes:

1. Normal Display: displays regular TRS-80 graphic characters.
2. Hi-Resolution: displays the character set that is programmed into the 80-GRAFIX.
3. Programming Mode: cause the 80-GRAFIX board to accept programmable character data and generate a set of characters.

## EASY DOES IT

The 80-GRAFIX board offers so much you'd think it was difficult to install. But it's actually very, very simple to hook up inside the TRS-80 case --- takes just a few minutes. While that voids the Radio Shack warranty, it's a minor inconvenience compared to the great leap in fun, excitement and usefulness the amazing 80-GRAFIX board provides.

## PROGRAMMA PROVED & BACKED

Like all PROGRAMMA International, Inc. products, the 80-GRAFIX board is backed by solid, unfailing support. We stand behind our products when you buy and after you buy. Ask anyone who's ever selected anything in the PROGRAMMA line.

## PRICE

Special introductory price: \$149.95, plus shipping and sales tax (California residents only). Visa and Master Charge accepted.

## QUESTIONS & ANSWERS

1. Is it easy to install?  
80-GRAFIX has 5 connectors which are "pushed on" to existing IC's. Two solder connections are required, and one pin must be bent or cut on an existing IC.
2. Are any trace cuts necessary?  
No, there are no trace cuts required.
3. Will Radio Shack install it?  
We don't think so, but some authorized dealers may be willing to do so.
4. What other hardware is required?  
None, 80-GRAFIX comes complete.
5. Will it work with existing Lower Case mods?  
Yes, it has been shown that the 80-GRAFIX board will operate with both, Radio Shack and other lower case mods.
6. Will it work with the Hi-Speed board?  
Yes, there appears to be no physical conflict with the speed-up boards.
7. Does it use any existing memory?  
No, 80-GRAFIX has its own 1K by 6 bit block of RAM on-board. It needs no other memory to operate.
8. Will the software you have still work?  
Most of it will work. Some packages such as SCRIPSIT and the Electric Pencil will not recognize the lower case set, but with the supplied driver, BASIC and Assembler programs can be made to run with the 80-GRAFIX board.
9. Can it be programmed in machine language?  
Yes, graphic programs will work much faster when written in assembler language and using the 80-GRAFIX board.
10. Can it do full screen plotting?  
80-GRAFIX provides the user with 64 programmable characters. It is possible to do full screen plotting, but access to each "dot" on the screen is not supported.
11. Does it work in color?  
No, the 80-GRAFIX board is only designed for your Black/White monitor.
12. Do you lose any of the normal graphics capabilities?  
No, the 80-GRAFIX board provides an alternate set of graphic characters. You may not, however, use both regular TRS-80 and the 80-GRAFIX character sets at the same time, although, alpha-numerics are available concurrently.

13. Will any dealers be handling it?

At this time, we don't know yet.

14. How much is it?

The price is \$149.95 plus tax and shipping. Included is a complete installation and instruction manual, a software lower case set with video driver, a couple of sample programs, including a BASIC program to create Hi-Res characters.

15. Will the board be supported?

Absolutely! PROGRAMMA is currently offering a Super Graphics Editor called "HIRES80", which allows you to create, store, and retrieve your developed character sets. This program can create tape or disk files which are readable by either BASIC or machine language for use within other programs. The cassette version of HIRES80 is available at \$15.95, while the disk version is \$19.95.

16. What warranty does the 80-GRAFIX board come with?

The 80-GRAFIX board has a warranty of 90 days from the date of purchase.

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Burbank, CA 91504

Please send all correspondence to the above address

Date	Purchase Order No.	Terms	Salesman
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California residents  
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PROGRAMMA/AMMA

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